

-GENERAL BIOLOGY-

**THE ROLES OF CORTICOTROPIN-RELEASING HORMONE AND
NEUROPEPTIDE Y IN THE REGULATION OF FEEDING BEHAVIOR IN XENOPUS
LAEVIS.**



Elizabeth Anne Chang, Erica Crespi, PhD*, Robert Denver, PhD*

3077 Department of Cell and Molecular Biology; University of Michigan, Ann Arbor MI 48104

eachang@umich.edu

Corticotropin-releasing hormone (CRH) and neuropeptide Y (NPY) are hypothalamic peptides often correlated with locomotion and feeding behavior in vertebrates. CRH has been shown to have appetite-suppressing effects in mammals, while NPY is a potent appetite stimulant. CRH is also important in the regulation of the stress response. Because feeding behavior ceases during times of stress in many animals, it is thought that CRH suppresses appetite only in stressful situations, but its role in the regulation of feeding in non-stressful situations is not understood. It is hypothesized that CRH and NPY neurons interact in the regulation of feeding. To find out more about NPY and CRH roles in feeding regulation, we are studying the amphibian, *Xenopus laevis* because they can provide an understanding of the evolution of feeding regulation in vertebrates, and can provide insight as to how these hormones function in more complex vertebrates. We will be identifying NPY and CRH neurons in the brain, and how the production of these hormones varies with nutritional status. To do this, we will collect brains from animals prior to feeding, immediately after a satiation feeding, after several days of food deprivation, and two weeks of food deprivation. Immunohistochemistry procedures for light and fluorescence microscopy will be performed to visualize NPY and CRH peptide levels at each time period. The targets of our observations will be the preoptic area, which is where CRH is produced in the stress response and is homologous to one of the feeding control centers in the mammalian brain. Additionally, we will observe the ventromedial hypothalamus, another feeding control center of the brain in mammals. CRH neurons have been observed in these areas in *X. laevis*, but their function in feeding regulation is unknown. This study will show how NPY and CRH peptide levels change with different states of positive and negative energy balance, and if there is a correlation between both levels. Since CRH can be an appetite suppressant it is expected that CRH levels will be low immediately before feeding, high right after feeding, and then low again throughout periods of food deprivation. NPY, as an appetite stimulant, is predicted to be high right before feeding, low immediately after feeding, and then generally high throughout food deprivation. This study may provide new information about the functions of NPY and CRH in the regulation of feeding in both amphibians and mammals, and provide baseline data for future studies of the function of NPY and CRH in different situations of stress.